

Application No. 10/796,965
Amendment dated January 13, 2006
Reply to Office Action of December 13, 2005

Docket No.: 0941-0932P

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of reducing step height, comprising:

providing a substrate comprising a low-voltage device area and high-voltage device area divided by an isolation structure and a pad oxide layer on the surface of the low-voltage device area and high-voltage device area;

sequentially forming a silicon nitride layer of at least about 500Å thick and a patterned mask layer, exposing the silicon nitride layer on the high-voltage device area and parts of the isolation structure adjacent thereto, overlying the substrate;

anisotropically etching the exposed silicon nitride layer using the mask layer as an etch mask, exposing the high-voltage device area and parts of the isolation structure;

sequentially removing the patterned mask layer and pad oxide from the surface of the high-voltage device area;

forming a first oxide layer on the exposed high-voltage device area and isolation structure using the silicon nitride layer as an oxidation mask;

sequentially removing the remaining silicon nitride layer and pad oxide layer from the surface of the low-voltage device area; and

forming a second oxide layer, thinner than the first oxide layer, on the low-voltage device layer.

2. (Original) The method as claimed in claim 1, wherein the isolation structure comprises a shallow trench isolation (STI) structure or field oxide (FOX) layer.

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3. (Original) The method as claimed in claim 1, wherein the first oxide is formed by thermal oxidation.

4. (Original) The method as claimed in claim 1, wherein the first oxide layer thickens gradually to a predetermined value and approximately maintains the thickness in areas further from the low-voltage device structure.

5. (Original) The method as claimed in claim 1, wherein the first oxide layer is about 1000 to 2000Å thick.

6. (Original) The method as claimed in claim 1, wherein the second oxide layer is formed by thermal oxidation.

7. (Original) The method as claimed in claim 1, wherein the second oxide layer is about 32 to 125Å thick.

8. (Original) The method as claimed in claim 1, wherein the silicon nitride layer on the low-voltage device area is removed by hot phosphoric acid.

9. (Currently Amended) A method of reducing step height, comprising:
providing a substrate having a low-voltage device area and high-voltage device area divided by an isolation structure;

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forming an patterned oxidation mask at least approximately 500Å thick ~~over the low-voltage device area and parts of the isolation structure~~ overlying the substrate, exposing the high-voltage device area and parts of the isolation structure;

forming a first oxide layer on the exposed high-voltage device area and isolation structure using the oxidation mask as a mask;

removing the oxidation mask; and

forming a second oxide layer, thinner than the first oxide layer, on the low-voltage device layer.

10. (Original) The method as claimed in claim 9, wherein the isolation structure comprises a shallow trench isolation (STI) structure or field oxide (FOX) layer.

11. (Original) The method as claimed in claim 9, wherein the oxidation mask is a silicon nitride layer.

12. (Original) The method as claimed in claim 9, wherein the first oxidation layer is formed by thermal oxidation.

13. (Original) The method as claimed in claim 9, wherein the first oxide layer thickens gradually to a predetermined value and approximately maintains the thickness in areas further from the low-voltage device structure.

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14. (Original) The method as claimed in claim 9, wherein the first oxide layer is about 1000 to 2000Å thick.

15. (Original) The method as claimed in claim 9, wherein the second oxidation layer is formed by thermal oxidation.

16. (Original) The method as claimed in claim 9, wherein the second oxide layer is about 32 to 125Å thick.

17. (Original) The method as claimed claim 9, wherein the oxidation mask is removed by hot phosphoric acid.

18. (Original) The method as claimed in claim 9, further comprising a pad oxide layer on the surface of the low-voltage device area and high-voltage device layer.

19. (Currently Amended) The ~~composite~~ method as claimed in claim 9, further comprising removing the pad oxide layer from the low-voltage device layer when the oxidation mask is removed.